CTX-Configuration-Store Deployment Plan

Contents

Versions

Document Revisions

The following revisions have been made to this document

Date	Revision	Notes
28/05/2019	1.0	First release
14/06/2019	1.1	Updated documentation for Replication steps.
02/10/2019	1.2	Updated Release
17/05/2021	1.3	Updated with AD Group functionality
09/11/2021	1.4	Added Section for Configuration file setup for Ad Control / Segregation. Updated Section 4.4 Create Database and Section 5 Configuring Replication with latest script and outcomes.

Module Versions

This version of the CTX-Configuration-Store-Install deployment plan is relevant up to version 1.2 of the CTX-Configuration-Store-Install module.

Preface

About this Manual

This document provides a guide on how to deploy the CTX-Config-Management module in your Cortex system.

Audience

This document is intended for those who require the use of CTX-Config-Management module.

Related Material

Document
CTX-Configuration-Store - User Guide.pdf
CTX-Configuration-Store-v1-3.studiopkg
CTX-Configuration-Deployment-Script.sql
Configuration_v01-to-v1_Migration.sql

Abbreviations used in this Document

SQL   Structured Query Language

SSMS   SQL Server Management Studio

AD   Active Directory

1   Requirements

This document details all the steps required to deploy the CTX-Config-Management module.

Requirements:

- Administrator access to Cortex Gateway

- Minimum Cortex v6.5 installed on the Cortex Application Server

- Access to the SQL Server instance

- SQL user must have SysAdmin authorisation on the SQL Server instance

- Minimum SQL Server 2012 (version 11.0.7001.0) installed on the Cortex Database Server

- PowerShell V5 installed on the Cortex Server

- PowerShell Active directory Module

2 Import CTX-Configuration-Store

To deploy the CTX-Configuration-Store module on your Cortex system, CTX-Configuration-Store Studio Package needs to be imported on your Cortex system. To do this:

- Download the CTX-Configuration-Store Studio Package

- Import the Studio Package in Cortex Gateway

- Ensure the relevant users have the required permissions in 'Studio Authorisation'

After this, all users in the authorised groups will be able to view and execute the subtasks.

3   Configuration Setup for AD Control / Segregation

In order to enable AD control for the module, a config file needs to be setup in the cortex application server.

Login to Cortex Application Server, Copy the below file to C:\Cortex\ Directory. Configure the file as per client specification. Refer to the user guide for each of the parameter and related default values, in case the file is not used.

cs-generic-config.tx
t

4 Deploy Cortex-ConfigStore Database

4.1 Overview

For the CTX-Config-Management module to work, the Cortex-ConfigStore database along with the schema must exist on the server where the Cortex databases exist. The following steps instruct you how to deploy the database and schema.

Note that if you are migrating from the old Configuration DB (v0.1), follow the steps outlined in the **Migrating (Old Version)** Section.

Additionally, PowerShell version 5 must installed on the Cortex Server for the AD Group filtering to work. This can be checked by opening PowerShell and running the following command:

$PSVersionTable.PSVersion

A similar output should be displayed as below:

```
PS C:\WINDOWS\system32> $PSVersionTable.PSVersion

Major  Minor  Build  Revision
-----  -----  -----  --------
5      1      16299  64
```

If the major version is not 5 or greater, then PowerShell needs to be updated; proceed to section 3.2. Otherwise, if it is version 5 or greater, skip to section 3.4.

4.2 Updating PowerShell to v5

- On the Cortex server where PowerShell version 5 will be installed, navigate to the following link:

    a. https://www.microsoft.com/en-us/download/details.aspx?id=50395&tduid=(162666df8fd7d1ab0239724a9bec1eca)(266696)(1503186)(61836X1384699Xf82af593098584c381b4505006d7472d)()

- Click the 'Download' button

Windows Management Framework 5.0

Language: English   Download
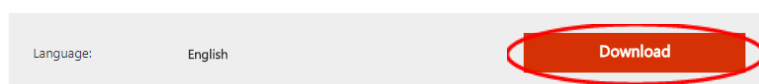
Windows Management Framework 5.0 includes updates to Windows PowerShell, Windows PowerShell Desired State Configuration (DSC), Windows Remote Management (WinRM), Windows Management Instrumentation (WMI). Release notes: http://go.microsoft.com/fwlink/?LinkID=717903

- Select the version required for the server where PowerShell is being installed

Choose the download you want

File Name	Size
W2K12-KB3134759-x64.msu	20.5 MB
Win7AndW2K8R2-KB3134760-x64.msu	20.8 MB
Win7-KB3134760-x86.msu	16.2 MB
Win8.1AndW2K12R2-KB3134758-x64.msu	18.8 MB
Win8.1-KB3134758-x86.msu	14.4 MB

- Click 'Next'
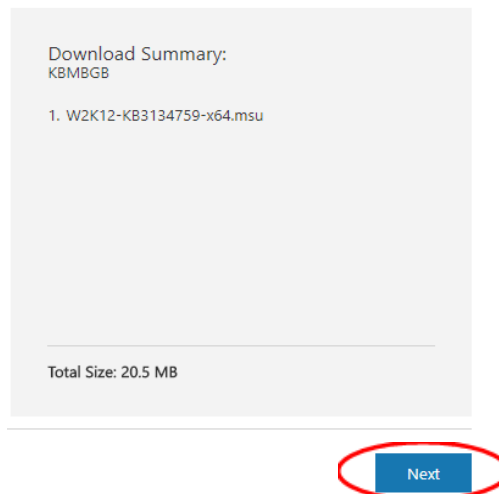
Download Summary:
KBMBGB

1. W2K12-KB3134759-x64.msu

Total Size: 20.5 MB

Next

- Select a location to download the file

- Navigate to the following link and follow the relevant instructions:

    a. **https://docs.microsoft.com/en-us/powershell/wmf/5.0/requirements**

4.3   Installing Active Directory Module

To install the Active Directory module run the following command in PowerShell as an Administrator

Install-WindowsFeature -Name "RSAT-AD-PowerShell" –IncludeAllSubFeature

4.4 Create Database

1   Open Remote Desktop Connection to the Cortex database server

2   Copy the 'CTX-Configuration-Store-Install.sql' script to the Cortex database server

3   Open 'CTX-Configuration-Store-Install.sql' in SQL Server Management Server (SSMS) and connect to the DB engine where the query should be executed (this is where Cortex DBs are hosted).

   a.   For a Replicated setup this step must be done on both the primary and secondary site.

4   Replace the SQL command variables as required:

   a.   The variables highlighted in green must change for each sight. An example is available in the **Configuring Replication** (optional).

```
:setvar CortexDBUser "domain\CTX_App_User_Service_Account"
:setvar DatabaseFilePath "C:\Cortex Databases"
:setvar DatabaseLogPath "C:\Cortex Databases"
:setvar Distribution_DataPath "C:\Cortex Databases\Distribution"
:setvar Distribution_LogPath "C:\Cortex Databases\Distribution"
:setvar InstanceName "LIVE_DBServerName\LIVE_InstanceName"
:setvar isReplicated "true"
:setvar MachineName "LIVE_DBServerName"
:setvar REPL_Admin_User "domain\CTX_SQL_Admin_User"
:setvar REPL_Working_Directory "C:\Cortex Databases\Replication Data"
:setvar ResilientInstanceName "DR_DBServerName\DR_InstanceName"
:setvar DatabaseName "Cortex-ConfigStore"
:setvar DefaultFilePrefix "Cortex-ConfigStore"
```

Variable	Description
CortexDBUser	The Database Interface User for Cortex, e.g. domain\Cortex_CerberusDB
DatabaseFilePath	The Database Datafile Path. This must contain the following sub-folders: • <Database Name> o Datafile
DatabaseLogPath	The Database Logfile Path. This must contain the following sub-folders: • <Database Name> o Logfile
Distribution_DataPath	The Distribution DB Datafile Path for the Db Server Instance. This must contain the following sub-folders: • distribution o Datafile
Distribution_LogPath	The Distribution DB Logfile Path for the Db Server Instance. This must contain the following sub-folders: • distribution

	o Logfile
InstanceName	The SQL Instance Name. See notes for Replication Setup. If there are no named instances, then this should just be the server name or Machine Name.
isReplicated	"True" if the database is to be replicated, "False" otherwise for a Standalone installation
MachineName	The Machine Name. See notes for Replication Setup.
REPL_Admin_User	The Admin User to handle Replication Jobs, e.g. domain\Cortex_SQLAdmin. In case of a standalone deployment, this parameter can be set to blank value.
REPL_Working_Directory	The Replication Working Directory (for Shared Drive). This must contain a folder called 'Replication Data'. In case of a standalone deployment, this parameter can be set to blank value.
ResilientInstanceName	The Instance Name of the Resilient Server (if replication is used).). In case of a standalone deployment, set this parameter to the same value specified for Instance Name. If there are no named instances, then this should just be the server name or Machine Name.
DatabaseName	The Configuration store database name. It is advised to leave the default value 'Cortex-ConfigStore'.
DefaultFilePrefix	The Configuration store database name. It is advised to leave the default value 'Cortex-ConfigStore'.

Example of a Standalone Implementation

```
:setvar CortexDBUser "LAB\CTX_SecureHub"
:setvar DatabaseFilePath "C:\Cortex Databases"
:setvar DatabaseLogPath "C:\Cortex Databases"
:setvar Distribution_DataPath ""
:setvar Distribution_LogPath ""
:setvar InstanceName "V-CTXDB17\DBLIVE"
:setvar isReplicated "false"
:setvar MachineName "CTXDB17"
:setvar REPL_Admin_User ""
:setvar REPL_Working_Directory ""
:setvar ResilientInstanceName "V-CTXDB17\DBLIVE"
:setvar DatabaseName "Cortex-ConfigStore"
:setvar DefaultFilePrefix "Cortex-ConfigStore"
```

Example of a Server without Named instance

```
:setvar CortexDBUser "LAB\CTX_SecureHub"
:setvar DatabaseFilePath "C:\Cortex Databases"
:setvar DatabaseLogPath "C:\Cortex Databases"
:setvar Distribution_DataPath "C:\Cortex Databases\Distribution"
:setvar Distribution_LogPath "C:\Cortex Databases\Distribution"
:setvar InstanceName "V-CTXDB17"
:setvar isReplicated "true"
:setvar MachineName "CTXDB17"
:setvar REPL_Admin_User "LAB\ctx_sql_admin"
:setvar REPL_Working_Directory "C:\Cortex Databases\Replication Data"
:setvar ResilientInstanceName "V-CTXDB18"
:setvar DatabaseName "Cortex-ConfigStore"
:setvar DefaultFilePrefix "Cortex-ConfigStore"
```

5   Create the relevant folder structure, as described in the table above. If Replication is required then the 'Replication Data' and 'distribution' folders must exist

6   Click on *Query* -> *SQLCMD Mode* and execute the query

7   On the messages panel, you should see no errors on the messages and the below text

```
Messages
   Creating Table [dbo].[AreaADGroupsLink]...
   Creating Table [dbo].[Areas]...
   Creating Table [dbo].[Customers]...
   Creating Table [dbo].[Environments]...
   Creating Table [dbo].[Param_Name]...
   Creating Table [dbo].[Param_Values]...
   Creating Table [dbo].[SYS_Sequence]...
   Creating Table [dbo].[SYS_SETTINGS]...
   Creating Foreign Key [dbo].[FK_Param_Values_Areas]...
   Creating Foreign Key [dbo].[FK_Param_Values_Customers]...
   Creating Foreign Key [dbo].[FK_Param_Values_Environments]...
   Creating Foreign Key [dbo].[FK_Param_Values_Param_Name]...
   Creating View [dbo].[CFG_View]...
   Creating View [dbo].[CGF_All_Permutations]...
   Creating Function [dbo].[udf_Get_Parameter_Value]...
   Creating Function [dbo].[udf_GetSequenceNumber]...
   Creating Trigger [dbo].[TRG_InsteadOfInsert_ADGroup]...
   Creating Trigger [dbo].[TRG_InsteadOfInsert_AreaADGroupsLink]...
   Creating Trigger [dbo].[TRG_InsteadOfInsert_Areas]...
   Creating Trigger [dbo].[TRG_InsteadOfInsert_Customers]...
   Creating Trigger [dbo].[TRG_InsteadOfInsert_Environments]...
   Creating Trigger [dbo].[TRG_InsteadOfInsert_Param_Name]...
   Creating Trigger [dbo].[TRG_InsteadOfInsert_Param_Values]...
   Creating Function [dbo].[udf_split_string]...
   Creating Procedure [dbo].[usp_Get_Job_Status]...
   Creating Procedure [dbo].[usp_InsertUpdate_ParamValues]...
   Creating Procedure [dbo].[usp_REPL_Add_Article]...
   Creating Procedure [dbo].[usp_REPL_Create_LogReader_Job]...
   Creating Procedure [dbo].[usp_REPL_Create_QueueReader_Job]...
   Creating Procedure [dbo].[usp_REPL_Create_Replicate_Job]...
   Creating Procedure [dbo].[usp_REPL_Create_Snapshot_Job]...
   Creating Procedure [dbo].[usp_REPL_CreateDefaultData]...
   Creating Procedure [dbo].[usp_REPL_Drop_Publication]...
   Creating Procedure [dbo].[usp_REPL_Remove_Replication]...
   Creating Procedure [dbo].[usp_REPL_Setup_Replication]...
   Creating Procedure [dbo].[usp_REPL_Start_Job]...
   Creating Procedure [dbo].[usp_REPL_Add_Publication]...
   Creating Procedure [dbo].[usp_REPL_Add_Subscription]...
   Creating Procedure [dbo].[usp_REPL_Create_Publication_CFG_Transactional]...
   Merging into SYS_Sequence
   Update complete.
```

8   In the left-hand panel, click the plus to the left of 'Databases' to expand 'Databases'

```
L-JLEES (SQL Server 11.0.7462 - cortex\joe.lees)
   Databases
   Security
   Server Objects
   Replication
   AlwaysOn High Availability
   Management
   Integration Services Catalogs
   SQL Server Agent
```
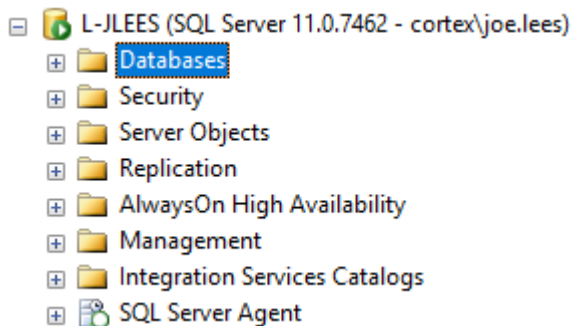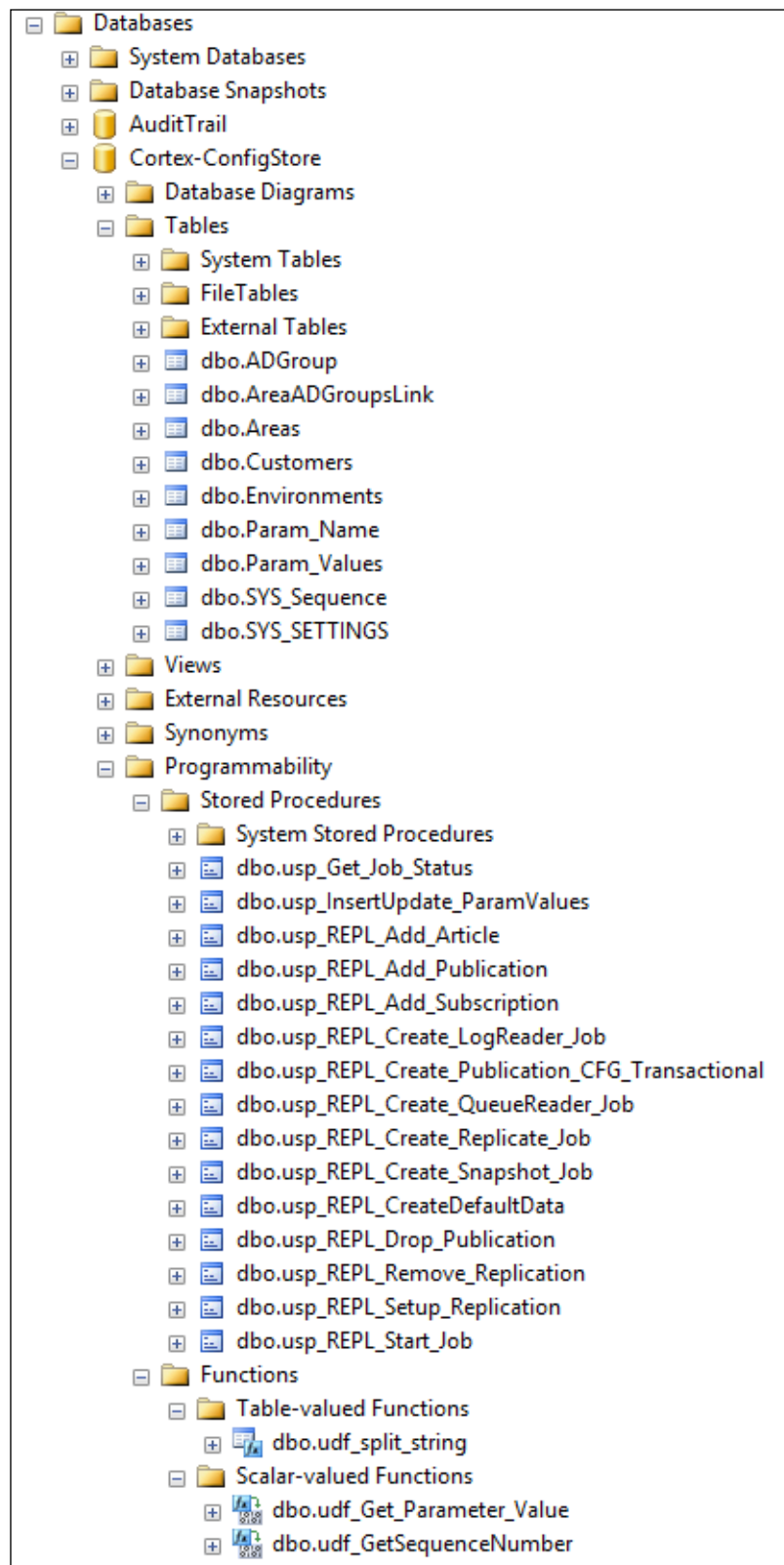
9   Right click 'Databases' and click 'Refresh'.

10   Validate the 'Cortex-ConfigStore' database has been created.
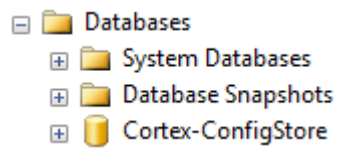
11   Expand 'Cortex-ConfigStore'

12   Expand 'Tables'

13   Expand 'Views'

14   Expand 'Programmability > Stored Procedures'

15   Validate the tables, views and stored procedures shown below are present

```
□ 📁 Databases
   ⊞ 📁 System Databases
   ⊞ 📁 Database Snapshots
   ⊞ 🗄 AuditTrail
   □ 🗄 Cortex-ConfigStore
      ⊞ 📁 Database Diagrams
      □ 📁 Tables
         ⊞ 📁 System Tables
         ⊞ 📁 FileTables
         ⊞ 📁 External Tables
         ⊞ 🞂 dbo.ADGroup
         ⊞ 🞂 dbo.AreaADGroupsLink
         ⊞ 🞂 dbo.Areas
         ⊞ 🞂 dbo.Customers
         ⊞ 🞂 dbo.Environments
         ⊞ 🞂 dbo.Param_Name
         ⊞ 🞂 dbo.Param_Values
         ⊞ 🞂 dbo.SYS_Sequence
         ⊞ 🞂 dbo.SYS_SETTINGS
      ⊞ 📁 Views
      ⊞ 📁 External Resources
      ⊞ 📁 Synonyms
      □ 📁 Programmability
         □ 📁 Stored Procedures
            ⊞ 📁 System Stored Procedures
            ⊞ 🞂 dbo.usp_Get_Job_Status
            ⊞ 🞂 dbo.usp_InsertUpdate_ParamValues
            ⊞ 🞂 dbo.usp_REPL_Add_Article
            ⊞ 🞂 dbo.usp_REPL_Add_Publication
            ⊞ 🞂 dbo.usp_REPL_Add_Subscription
            ⊞ 🞂 dbo.usp_REPL_Create_LogReader_Job
            ⊞ 🞂 dbo.usp_REPL_Create_Publication_CFG_Transactional
            ⊞ 🞂 dbo.usp_REPL_Create_QueueReader_Job
            ⊞ 🞂 dbo.usp_REPL_Create_Replicate_Job
            ⊞ 🞂 dbo.usp_REPL_Create_Snapshot_Job
            ⊞ 🞂 dbo.usp_REPL_CreateDefaultData
            ⊞ 🞂 dbo.usp_REPL_Drop_Publication
            ⊞ 🞂 dbo.usp_REPL_Remove_Replication
            ⊞ 🞂 dbo.usp_REPL_Setup_Replication
            ⊞ 🞂 dbo.usp_REPL_Start_Job
         □ 📁 Functions
            □ 📁 Table-valued Functions
               ⊞ 🞂 dbo.udf_split_string
            □ 📁 Scalar-valued Functions
               ⊞ 🞂 dbo.udf_Get_Parameter_Value
               ⊞ 🞂 dbo.udf_GetSequenceNumber
```

16   If setting up for Replication, repeat these steps on the Replicated (secondary) site

5 Configuring Replication (optional)

5.1 Example SQLCMD Variables

The following table shows an example for configuring a Replicated Setup. In this example there are 2 SQL Servers (Site-A and Site-B) each with a default SQL Instance. The domain in use is 'CTXExample' with 2 SQL Users – Cortex_CerberusDB and Cortex_SQLAdmin. On both sites the Databases should be under C:\Databases, with individual folders for distribution, Cortex-ConfigStore, and the Replicated Data folder (with all subfolders configured as mentioned in the section).

Variable	Site A Configuration	Site B Configuration
CortexDBUser	CTXExample\Cortex_CerberusDB	CTXExample\Cortex_CerberusDB
DatabaseFilePath	C:\Databases	C:\Databases
DatabaseLogPath	C:\Databases	C:\Databases
Distribution_DataPath	C:\Databases	C:\Databases
Distribution_LogPath	C:\Databases	C:\Databases
InstanceName	Site-A	Site-B
IsReplicated	true	true
MachineName	Site-A	Site-B
REPL_Admin_User	CTXExample\SQLAdmin	CTXExample\SQLAdmin
REPL_Working_Directory	C:\Cortex Databases\Replication Data	C:\Cortex Databases\Replication Data
ResilientInstanceName	Site-B	Site-A
DatabaseName	Cortex-ConfigStore	Cortex-ConfigStore
DefaultFilePrefix	Cortex-ConfigStore	Cortex-ConfigStore

5.2 Steps to Configure (Post-Deploy)

Before configuring the Replication, the 'Replicated Data' folder must be set up as a shared drive. To do this, right click on the folder and click on the Shared tab. Ensure that it is set to read/write, as this will allow both SQL Servers to communicate with each other via the Shared Folder.

Once the Config Store has been deployed on both database, the following steps should be followed in order (under the context of the Config Store Database):

Site	Command
Site-A	exec [dbo].[usp_REPL_Setup_Replication] This sets up the replication / distribution DB and the linked servers on Site A.
Site-B	exec [dbo].[usp_REPL_Setup_Replication] This sets up the replication / distribution DB and the linked servers on Site B.
Site-A	exec [dbo].[usp_REPL_Create_Publication_CFG_Transactional] This adds the relevant data to Replication on Site A
Site-B	exec [dbo].[usp_REPL_Create_Publication_CFG_Transactional] This adds the relevant data to Replication on Site B

5.3 Testing Replication

First, the jobs should be checked to ensure no failures. This can be done by expanding SQL Server Agent and double clicking on Job Activity Monitor on each DB, and looking at the Replication-related jobs.

Site	Action
Site-A	Check all required objects and jobs. Insert data and check on other side.
Site-B	Check all required objects and jobs. Insert data and check on other side.

If there are any issues with the replication, there are troubleshooting steps listed in the **Troubleshooting Replication** section.

5.4 Removing Replication

Site	Command
Site-A	exec [dbo].[usp_REPL_Drop_Publication] 'All Tables' Removes the Publication from Site-A
Site-B	exec [dbo].[usp_REPL_Drop_Publication] 'All Tables' Removes the publication from Site-B
Site-A	exec [dbo].[usp_REPL_Remove_Replication] Removes the Replication and all related Jobs / Objects from Site-A
Site-B	exec [dbo].[usp_REPL_Remove_Replication] Removes the Replication and all related Jobs / Objects from Site-B
Site-A	Check all required objects and jobs are removed
Site-B	Check all required objects and jobs are removed

6   Troubleshooting Replication

6.1   Jobs

If there are issues in the replication, the first step is to check the Jobs. These can be checked under SQL Server Agent -> Job Activity Monitor by then right-clicking the relevant job and selecting 'View History'.

6.1.1   Relevant Jobs

These all assume the default name of 'Cortex-ConfigStore' has been selected.

Job Name	Details	Steps
Cortex-ConfigStore Replication - All Tables	This should always be running and handles the Replication of data	If the job is not running then it should be started manually. Any logs should be checked, and if required it can be stopped and re-started.
Cortex-ConfigStore Replication – Transaction Log Reader	This should always be running	If the job is not running it should be started.
Cortex-ConfigStore Replication – Transaction Queue Reader	This should always be running	If the job is not running it should be started.
Cortex-ConfigStore Replication – Snapshot All Tables	This is only used when a new snapshot is generated	N/A

6.2   Re-Create Replication

If there are still issues with the replication after checking the jobs, the Replication should be dropped and then re-created. To do this, follow the steps in the **Removing Replication** section followed by the steps in the **Steps to Configure (Post-Deploy)** section, and then test the Replication again.

7   Migrating (Old Version)

It is possible to migrate from the old version of the Configuration Store to the latest version. The steps are outlined below:

7.1   Pre-Requisites:

Before beginning this process, back up your existing Config Store Database.

Note that migration will replace your existing Database in the existing server location. For this reason, some of the SQLCMD Variables such as 'DatabaseFilePath' will not be relevant.

Before running any scripts, ensure that the context of the query window is set to the Configuration Database.

7.2   Migration Steps

1   Paste the CTX-Configuration-Store-Database-Migration-v01-to-v1.sql migration script into the SQL Query Window and ensure SQLCMD mode is enabled

2   Fill in variables at the top of the script. See the **On the** Cortex server where PowerShell version 5 will be installed, navigate to the following link:

   b.   **https://www.microsoft.com/en-us/download/details.aspx?id=50395&tduid=(162666df8fd7d1ab0239724a9bec1eca)(266696)(1503186)(61836X1384699Xf82af593098584c381b4505006d7472d)()**

•   Click the 'Download' button

•   Select the version required for the server where PowerShell is being installed

•   Click 'Next'

•   Select a location to download the file

•   Navigate to the following link and follow the relevant instructions:

7.3 Installing Active Directory Module

To install the Active Directory module run the following command in PowerShell as an Administrator

```
Install-WindowsFeature -Name "RSAT-AD-PowerShell" –IncludeAllSubFeature
```

3   Create Database section for reference

4   Run the script to move the old data to a temporary location, create the new schema, and transfer the old data from the temporary location to the new Database.

   a.   Once run, ensure that no error messages are displayed on the SQL Server Results panel

5   Validate that the data is migrated and correct, and the table objects are all in place. See **On the** Cortex server where PowerShell version 5 will be installed, navigate to the following link:

   b.   https://www.microsoft.com/en-us/download/details.aspx?id=50395&tduid=(162666df8fd7d1ab0239724a9bec1eca)(266696)(1503186)(61836X1384699Xf82af593098584c381b4505006d7472d)()

- Click the 'Download' button

- Select the version required for the server where PowerShell is being installed

- Click 'Next'

- Select a location to download the file

- Navigate to the following link and follow the relevant instructions:

   a.   **https://docs.microsoft.com/en-us/powershell/wmf/5.0/requirements**

7.4 Installing Active Directory Module

To install the Active Directory module run the following command in PowerShell as an Administrator

```
Install-WindowsFeature -Name "RSAT-AD-PowerShell" –IncludeAllSubFeature
```

6   Create Database section for details.

7   Run the script to delete old data

        a.   CTX-Configuration-Store-Database-Migration-v01-Complete-Removal.sql

        b.   Once run, ensure that no error messages are displayed on the SQL Server Results panel.

7.5 Rollback

In case of any issues, there is also a script provided to roll back to the old version. This should **NOT** replace a proper backup, which should always be taken manually before migrating.

See the following script: CTX-Configuration-Store-Database-Rollback-v1-to-v01.sql